

## MICRO-OPTO-ELECTRO-MECHANICAL SWITCHING SYSTEM

### ABSTRACT OF THE DISCLOSURE

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An embodiment of the invention comprises an optical element capable of motion in at least one degree of freedom wherein the motion in at least one degree of freedom is enabled by serpentine hinges configured to enable the optical element to move in at least one degree of freedom. The embodiment further includes driving elements configured to deflect the optical element in said at least one degree of freedom to controllably induce deflection in the optical element and a damping element to reduce magnitude of resonances. Another embodiment includes a MEMS optical apparatus comprising an optical element capable of motion in two degrees of freedom. The two degrees of freedom are enabled by two pairs of serpentine hinges. A first pair of serpentine hinges is configured to enable the optical element to move in one degree of freedom and a second pair of serpentine hinges is configured to enable the optical element to move in a second degree of freedom. The apparatus further includes driving elements configured to deflect the optical element in said two degrees of freedom and a damping element to reduce magnitude of resonances. The invention includes method embodiments for forming arrays of MEMS optical elements including reflector arrays.

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